**MAE 303 – Mechanics of Fluids – Chapter 1-Definitions of Some Important Terms**

1. fluid – a substance that **(initially)** deforms under an applied shear stress and continuously deforms
2. solid – a substance that **(initially)** deforms under an applied shear stress, but does not continuously deform
3. fluid mechanics – the study of fluids at rest and in motion and the interaction of the forces exerted on them **(on any solid boundary the fluid contacts)**
4. fluid statics – the study of fluids at rest
5. fluid dynamics – the study of fluids in motion
6. incompressible fluid – a fluid with **~~non-constant~~ constant** density
7. compressible fluid – a fluid with **~~constant~~** **variable** density
8. compressible flow – **flow with fluids at constant density flow of a gas at M>0.30**
9. Mach number – the ratio of the **(local)** fluid velocity to the **(local)** velocity of sound
10. speed of sound = 343 m/s **(√ γ RT)**
11. R – ideal gas constant
12. T – temperature (absolute temperature)
13. γ – ratio of c\_p to c\_v
14. cp – constant pressure specific heat
15. cv – constant volume specific heat
16. specific weight – the weight of a fluid per unit volume
17. specific gravity – the ratio of the fluid’s density to the density of water
18. subsonic flow – M < 1
19. sonic flow – M = 1
20. transonic flow – 0.8 ≤ M ≤ 1.2
21. supersonic flow – M > 1
22. hypersonic flow – M > 6
23. viscosity –
    1. dynamic viscosity (μ) (N∙s/m^2)
    2. kinematic viscosity (ν) = μ/ρ (m^2/s)
24. inviscid fluid – fluids where viscous forces = 0
25. viscous fluid – fluids where viscous force ≠ 0
26. Newtonian fluid – fluids where shear stress is linear with velocity gradient
27. non-Newtonian fluid – fluids where shear stress is not linear with velocity gradient
28. steady flow – flow that is not dependent on time
29. unsteady flow – flow that is dependent on time
30. laminar flow – low Reynolds number
31. turbulent flow – high Reynolds number
32. d’Alembert’s Paradox – Assuming that there is no drag but the experiment revealed that there was drag